DOCUMENT RESUME

ED 412 394 CE 074 954

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TITLE	Competencies in Two Sectors in which Information Technology (IT) Exerts a Strong Influence: Telecommunications and Administration/Offices. Case Studies in Italy, France and Spain. Final Report. CEDEFOP Panorama.
INSTITUTION	European Centre for the Development of Vocational Training, Thessaloniki (Greece).
PUB DATE	1996-11-00
NOTE	62p.
PUB TYPE	Reports - Research (143)
EDRS PRICE	MF01/PC03 Plus Postage.
DESCRIPTORS	Case Studies; Competence; *Competency Based Education; Educational Needs; Employment Patterns; Employment Practices; Employment Qualifications; Foreign Countries; *Information Technology; Job Skills; Needs Assessment; *Office Management; *Office Occupations Education; Organizational Change; Postsecondary Education; Secondary Education; Technical Education; *Telecommunications; Trend Analysis; Vocational Education
IDENTIFIERS	France; Italy; Spain

ABSTRACT

As part of a larger effort to pinpoint emerging training needs, case studies of the telecommunications and administration/offices sectors were conducted in Spain, Italy, and France to identify new information technology (IT) competencies required of employees in those fields and determine whether IT has similar consequences in individual European Union-member states. Data were collected from relevant publications and documentation and interviews with key exponents and experts in the sectors. In all three countries, the introduction of IT has tended to make mechanical, lesser-skilled tasks superfluous and has required competencies related to the ability to obtain, select, process, and disseminate information. The introduction of IT in firms and organizations has tended to parallel organizational changes involving a transition from highly hierarchical structures to project groups, thus creating a new emphasis on abilities such as self-esteem, creativity, adaptability, responsibility, self-control, and ability to work in teams. Differences were discovered in the degree of IT implementation in Spain, Italy, and France. Significant differences in occupational classifications were found, both between and within individual countries. In all three countries, initial training provision for both sectors was undergoing significant renewal in terms of technological content. (Contains 68 references) (MN)

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Competencies in two sectors in which information technology (IT) exerts a strong influence: Telecommunications and Administration/ offices

Case studies in Italy, France and Spain

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Competencies in two sectors in which information technology (IT) exerts a strong influence: Telecommunications and Administration/offices

Case studies in Italy, France and Spain

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November 1996

Thessaloniki 1997

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The Centre was established by Regulation (EEC) No 337/75 of the Council of the European Communities, last amended by Council Regulation (EC) No 251/95 of 6 February 1995 and Council Regulation (EC) No 354/95 of 20 February 1995.

Final report 3

Cataloguing data can be found at the end of this publication.

CEDEFOP – European Centre for the Development of
Vocational Training, Thessaloniki 1997

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Printed in Germany

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CEDEFOP Preface

1995 was an important year for consolidating political activities in the European Union for the information society. One important event was the G7 ministerial conference on the information society which provided an opportunity to reflect on the nature of global phenomena in the information society. 1996 was declared the European Year of Lifelong Learning and was marked by two main topics of reflection: the Lilis conference (Lifelong Learning for the Information Society) and People First (Challenges of Living and Working in the European Information Society) which respectively were part of the programmes during the Italian and Irish Presidencies.

As the conferences clearly showed, the priorities set are identical in all technologically advanced countries: liberalising telecommunication structures and services, standards, protection of intellectual property and the needs of global services. Of extremely high importance are social and political aspects such as the rights of citizens to access information and the need to avoid an unbalanced information society. Information technologies are already present in many areas of our lives. We are moving towards a situation in many countries where every worker has his own PC and already 50 million users are connected to the Internet.

Advancement towards the information society will result in erosion of confines in industry, society and the economy as a whole. Companies be they in industry or the services sector are becoming companies based on knowledge and on account of information technology and telecommunications they are redefining their processes and changing their organisational structure. This prompts the need for new qualifications and/or new competencies to guarantee that they remain competitive on the market.

Empirical evidence and economic analysis show that the diffusion of information technology and communications have a positive effect on creating employment on the long-term even though on the short and medium term the restructuring processes may lead to a temporary loss of jobs.

This study is part of the CEDEFOP work programme which envisages formulation of a reference framework which the European Commission could use as one component of a periodic report on the development of vocational training in the Member States.

The study, which was conducted in three countries (Spain, France and Italy), aims to identify new professional competencies in which information technologies have a particularly strong impact: telecommunications, a sector which plays a vital role in the evolution of IT and administration and office work which make general use of IT and which, while not a productive sector, is a transversal and intersectoral area processing data and information.

The study envisages the description of certain functional activities and definition of the required competencies in order to provide a reference framework for training curricula.

The study was conducted on behalf of CEDEFOP and in collaboration with FUNDESCO (Foundation for the Social Development of Communications) and ISFOL (Institute for the Development of Vocational Training of Workers) by the following working group:

- Lazaro Gonzalez, Spanish and French reports and editing of the final report
- Mario Gatti and Claudio Tagliaferro, Italian report. Maria Grazia Mereu collaborated in the research.

Stavros Stavrou
Deputy Director

Mara Brugia
Project co-ordinator

I. INTRODUCTION: THE FRAMEWORK OF THE STUDY

1. OBJECTIVE

The present study is part of a work programme relating to vocational training in the Member States of the European Union and, more specifically, the Community Directory of Occupational Profiles which CEDEFOP has been developing for a number of years.

Information technology (IT) has a profound impact on the daily lives and work of European citizens who are increasingly being integrated into an information society.

Similarly, IT is inevitably changing the organisation of economic activity and the demands on human resources and competencies.

The objective of the study, conducted in three Member States - Spain, Italy and France - is to identify the new competencies necessary in sectors of activity in which information technology exerts a strong influence. It is hoped that identification of these new competencies will open up avenues for the renewal of vocational training systems.

Two sectors were chosen for analysis: telecommunications, as a sector which is currently a driving force in the development of IT, and the administration/offices which, although not a sector of production, is nevertheless a transversal area in all organisations with the principal task of processing information and therefore makes general use of IT.

The final objective of the study is to determine a series of occupations or "related functional activities" (*figures professionelles types)* in order to identify new competencies on which IT exerts an influence. It is hoped that this will serve to pinpoint emerging training needs.

The study endeavours to strike a balance between two extremes: on the one hand, a mere description of generic competencies valid for any occupational field involving the use of IT; and, on the other, an analysis of specific workplace profiles. In the first case, the study would have little to contribute in terms of new elements and in the second it would be difficult to generalise these profiles beyond concrete business contexts. The objective of the research team was to establish whether IT has similar consequences for competencies in the various Member States, over and above divergences between specific firms and different national realities.

2. CONCEPTUAL OPTIONS

FUNDESCO (Fundación para el Desarrollo de la Función Social de las Comunicaciones) and ISFOL (Instituto per lo Sviluppo della Formazione Professionale dei Laboratori) were commissioned by CEDEFOP to perform this study.

The research team selected three fundamental concepts for the study: work involving the processing of information with the aid of new technologies, vocational competencies and the functional areas and related functional activities most characteristic of each one.

a) Work involving the processing of information with the aid of new technologies

Information is of key importance to production processes, the advantage being that it is completely under human control.

Information is necessary for decision-making processes. An organisation's success is increasingly dependent on each of its members having the right information provided at the right place and the right time.

Information technology represents a set of tools and methods, based on the development of physical, electronic technologies which permit the processing of common symbols: numbers, words and images. These generally include a series of products and services: components, EDP (software, hardware and services), consumer and professional electronics, telecommunications and the audiovisual industry.
This study is focused on EDP, telecommunications and telematics.

These tools and methods process information which can only be integrated in a concrete context by means of human intelligence.

The integration of information technology into processes of production not only entails the substitution of human effort for routine tasks, but also triggers changes in the methods of performing the remaining tasks. Moreover, it extends the role of supervisors and middle management since processes of production are focused on project groups, and in general, increases the skill requirements of all those working in this environment.

Work involving information processing implies knowledge of how to use IT for specific purposes, rather than highly specialised knowledge of the technology itself. It frequently implies the ability to use the information obtained in a given situation to resolve problems in a different situation.

The task of information processing not only requires familiarity with computing mechanisms but also - and perhaps most importantly - implies a human outlook and approach towards the purpose to be achieved with the information in question, i.e. awareness of the significance acquired by the symbols in a real context and, ultimately, creative thinking. Information technology is based on knowledge stemming from people's ideas. These ideas, in turn, must be

shared with others to generate results in the field of research or production which may be minimally significant for an organisation.

In order to be able to process information, one must previously learn to obtain and select information, be able to listen and, ultimately, learn to learn.

Information processing is therefore far from being something simple or exclusively related to the ability of information technology users. It implies the mobilisation of various types of theoretical, technical and procedural knowledge and sometimes the development of personal and social competencies closely related to each person's previous experience and background.

b) Vocational competencies

This being another fundamental concept of the study, it is necessary to clarify the sense in which it is used in this context. As highlighted in issue no. 1/1994 of the CEDEFOP European Vocational Training Journal, despite the increasing and general use of the term "competencies", it neither holds the same meaning nor has been analysed to the same extent in the various Member States.

In this study, the term "vocational competence" refers to overall knowledge, skills and abilities resulting from a worker's training, experience and history and includes various partial competencies of a technical, methodological, social and administrative nature.

Competence can also be defined, as suggested by Le BOTERF (1994), as the mobilisation of knowledge which each individual person has learned to select, integrate and mobilise: theoretical, procedural, practical and intuitional knowledge which flow from experience and social skills (adaptational, communication, ethical, etc. skills). To a certain extent, they are an updated version of knowledge, know-how and social skills in an occupational situation.

When this knowledge is recognised in a concrete occupational context, we can talk about competent professionals with know-how which is operational and validated in this working environment.

The competencies to be identified in the framework of this study relate to occupational activity in situations involving the processing and communication of information in production contexts implementing IT.

c) Functional areas and related functional activities

The term functional area refers to the set of tasks or functions performed in the context of an enterprise or a public agency which contributes to the performance of a service or constitutes a phase of the production process.

Each functional area includes one or more related functional activities with similar and complementary competencies, although not necessarily involving the same degree of training and responsibility. Different workplaces may

share vocational competencies and form part of the same related functional activities.

Although a theoretical construction, this concept offers an opportunity for the analysis and comparison of similar competencies and training over and above the differences of occupational classifications dependent on each geographical and business context.

The present study focuses on the following functional areas:

Telecommunications

1. Studies, projects and planning, with the following tasks:
   - Design of standards and plans for network utilisation.
   - Project design and implementation (engineering).
   - Technical estimates.

2. Installation, operation and technical assistance, with the following tasks:
   - Contracts and supplies.
   - Network and hardware installation.
   - Operations and maintenance.
   - Network data and resources management.

3. Marketing and services sales, with the following tasks:
   - Business forecasts.
   - New products and services design.
   - New products and services sales.
   - Information or technical assistance for clients (pre- or post- sales).

The study focuses on communication network operators, electronic information service suppliers and qualified or value-added services.

Administration/offices

It is difficult to differentiate between functional areas and related functional activities in this field since in small and medium-sized firms there is sometimes only one person responsible for a whole area or even the entire administrative functions of the company. However, for the purposes of the description of competencies, the study initially proposed to consider the following areas:

1. General administration, responsible for a wide range of administrative procedures (ranging from accounting to human resources), which generally represents all the administrative functions of a small or medium-sized undertaking.
2. Business administration, specialised in the management of corporate affairs.
3. Secretarial work, with the task of providing administrative support to the tasks of the management or specific departments.
4. Accounting, responsible for economic management.
5. Human resources management, responsible for administration of company personnel.

6. Reception, information and public relations, with the task of dealing directly with suppliers, clients, information-seekers, etc.

3. METHODOLOGY AND PHASES OF THE STUDY

The study was conducted in the period June 1995 - June 1996. In the initial phase, CEDEFOP, FUNDESCO and ISFOL organised a series of working meetings to:

- Set up the research team.
- Define the general objectives of the study.
- Delimit the field of investigation.
- Define conceptual options and methodological criteria.
- Establish phases and a working schedule.
- Decide on the structure of the final report.

The commencement of the study was followed by four fundamental phases:

1. Analysis of existing relevant publications and documentation, both of a general nature and with specific reference to one of tne three Member States covered in the study - Spain, Italy and France.

2. Elaboration of various theses relating to the functional interrelations between undertakings in the telecommunications and administration/office sectors and identification of the related functional activities most significant for each area..

3. Verification, for each of the two sectors and the three Member States, of the compiled list of related functional activities and individual identification of new competencies by means of interviews with key exponents and experts in the sector. Access criteria were also analysed with reference to initial training, experience and continuing training.

4. Exchange of the three national reports and drafting of the final summary.

II. TELECOMMUNICATIONS AND ADMINISTRATION, TWO AREAS AFFECTED BY CHANGE

1. INTRODUCTION: THE IMPACT OF THE INFORMATION SOCIETY

Information technology (IT) is omnipresent in all fields of human activity. Unlike traditional technologies, IT is characterised by a low consumption of energy, raw materials and non-renewable resources. These technologies are ushering in extremely profound changes in the organisation of economic activity and forms of human relations and are the new tools used to advance towards the information society.

IT represents an enormous market of hundreds of billions of dollars, with an annual growth rate of approx. 10% in global terms; the lion's share of this market is concentrated in a handful of countries, including a number of EU Member States.

1995 was an important year for the consolidation of the EU's policy initiatives to promote the information society. One important event in this respect was the G7 ministerial conference in Brussels which reflected upon the global phenomenon of the information society and related priorities which are common to all technologically advanced countries:

- Liberalisation of the telecommunications and audiovisual sectors.
- Regulation and standardisation of hardware and networks.
- Lower prices for services.
- Protection of intellectual property rights.
- Protection of personal data and privacy.
- Information systems safety.

Social and political aspects, e.g. citizens' rights of access to information and the need to prevent an imbalanced information society, are of particular importance in this context. The conference drew attention to the fact that we are already living in the information society. Information technology and information highways are already present in many aspects of our lives.

The movement towards the information society is eroding the traditional borders within industry, the economy and society. Firms are increasingly reliant on knowledge and are designing their own production processes and organisational forms on the basis of IT and telecommunications. The introduction of IT is obliging firms to:

- reorganise workers in multidisciplinary teams,
- provide for the multiskilling of their workers,
- assure a more rapid information flow in the workplace,
- reorganise production along "just-in-time" principles, requiring extremely precise information,
- establish relations of confidence and long-term commitment with clients and suppliers.

IT is making a positive contribution to the creation of long-term employment, although jobs are temporarily being lost in the short and medium term in the wake of restructuring processes.

The challenges posed by the new EDP systems are inevitably triggering changes in the competencies required from human resources. At the moment, re-skilling of in-service personnel, the introduction of new resources and the outsourcing of various functions are causing serious problems. The competencies most in demand and with the best job opportunities are those held by experts in relational databases, the INTERNET, object-orientated software development and network services management and creation.

In general terms, a higher level of skilling is required to work in IT environments, while lesser qualified jobs are disappearing in the wake of process automation.

The process of automation has transformed the team or project group into the basic unit of production, substantially changing the traditional hierarchical organisation of responsibilities in firms. Information has become an strategic factor of production, and the competencies of workers in handling this information are essential.

In view of the importance being acquired by the integration of decentralised, heterogeneous and complex resources, information cannot develop without network logic at either global, regional or local level. In this development, network management is becoming a critical element since its increasing complexity requires access control, software management, access to resources, services or databases and functional development. The user-friendliness of PCs fitted with a permanently open user interface, connected up to networks means that firms can perform increasingly strategic activities without leaving the operative field of personal computing. The undertakings, including SMEs, are thus progressing from the previous stage - the introduction of microcomputing as a simple means of information processing - to the present stage in which the trend is to use this information as an internal and external communication medium.

2. TECHNOLOGICAL AND ORGANISATIONAL CHANGE

2.1. In the field of administration/offices

Over the last 15 years there has been an increase in the number of administrative and office workers in the three Member States, despite the fact that the generalized introduction of microcomputing has eliminated a number of routine, lesser skilled tasks. A profound transformation of administrative processes has also taken place in the three countries.

Firms in all sectors are subject to extremely high pressure to introduce effective and efficient methods of management, above all from the marketing and organisational points of view. This means acquisition of state-of-the-art information technology with relevant consequences for the professional or managerial roles involved.

Trends in management and IT systems have run parallel in three fundamental phases, along the lines proposed by Invernizzi (1989):

1. **Office automation**. Electronic tools are introduced for the automation of a series of simple, manual, time-consuming operations performed by lesser skilled workers. At this level it is still a question of individual productive and organisational improvements, assisted by word processors, graphic programmes, spreadsheets and electronic filing. This leads to job enrichment for secretarial and administrative staff. The use of technical aids emerges for interpersonal communication, e.g. E-mail, teleconferencing, etc. This, on the one hand, reduces the importance of the role of secretarial staff and, on the other, promotes the exchange of personalised and direct information.

   But the focus of electronic data processing (EDP) is the processing and effective storage of data, the implementation of efficient transactions and optimisation of implementation time.

2. **Partial or total automation of the information and data production system**

   In this phase the focus is on structured information flows and the integration of data processing into each corporate function and the demand and production of reports.

   Automation is initially introduced to a number of accounting, administrative and management processes, gradually followed by information/control objectives derived from the obtainable information.

   The technologies used are data processing and production, information flow control and regulation and centralised production of information, i.e. Management Integrated System (MIS) technologies.

   These technological and organisational changes have a profound impact on workers' functions with a corresponding increase in viability and flows of exchange between users in various forms: EDP control centre managers, data input operatives and information recipients. At the level of EDP control centre managers, the lower-level roles disappear. Those inputting information as individuals or with an administrative role are already part of the management system while information recipients increase management control, now possible in real time.

3. **Automation of information selection and analysis processes and the creation of EDP decision support systems**

   This phase is rendered possible by Decision Support Systems (DSS) and Expert Decision Support Systems (EDSS). DSSs are personalised systems used to obtain information over and above standardised reports. They offer various levels of sophistication in data analysis, a summary of specific data (data retrieval), data correlation between one or more databases (data analysis), preventative studies on the consequences of various decision-making options, analysis of optimal combinations of variables to be mobilised for the optimisation of an objective, the use of logical models to examine the possible alternatives of an option and identification of the best option.

DSS technologies are therefore focused on decision-making. The emphasis is on flexibility, adaptability and rapid response, processes managed by the final users and support of the decision-making styles of each manager. These are the most important technologies, not only in view of the ensuing changes in a number of occupational and management roles, but also because they may trigger changes in the organisational structure of the firm and, in particular, the location of responsibility, decentralising responsibility and decision-making.

Although it cannot be said that these three technological and organisational phases can be observed in all the offices in the three Member States of our study, and SMEs to an even lesser extent, the pressure of competition makes movement in this direction inevitable.

The main consequences of this process in the immediate future will undoubtedly be a loss of market opportunities for firms with an extremely hierarchised system of responsibilities and decision-making and the need to transform human resources policies to achieve a better integration of all members of the organisation in the information and decision-making processes.

2.2. In the telecommunications sector

The telecommunications sector in Europe was previously run as a monopoly, essentially dealing with telephone services until the 1980s. This situation began to change several years ago with the liberalisation of the market for value-added services. Full liberalisation of this sector by 1 January 1998 is envisaged by a Community directive.

The first technological challenge to the traditional structure of the telecommunications sector was the development of satellites, which highlighted the existence of an economy of scale in the field of large-distance communications. A second challenge was the digitalisation and computerisation of telecommunications networks. Networks can be digitalised without the replacement of existing networks by adding software and electronic installations. Many functions previously performed within the networks can now be implemented externally by the use of sophisticated terminals.

These developments are opening up opportunities for non-traditional operators and facilitating the set-up of private networks.

For a number of years the capacity of traditional wire-based technologies represented an obstacle to the expansion of new services and integration of the familiar services. This problem was resolved by optic fibre technologies, which have enormously increased the transmission capacity of telecommunication networks and rendered transmission costs almost independent of distance and the volume of information transmitted.

The integration of various types of communications is now possible thanks to technological development which also means that new operators may enter the business. One example of this phenomenon is the integration of telematic services and cable television, meeting the new needs of users and firms.

Finally, the Integrated Services Digital Network (ISDN) and Integrated Broadband Communication (IBC) may have a significant impact on the supply and consumption of sophisticated telecommunication services, especially in the case of firms.

The telecommunications sector may currently be regarded as being divided into six major service fields:

1. **Basic telephone services**, including local, interurban and international telephony, the latter showing a particularly high growth rate.

2. **Services with value added**, including on-line information services (the most important segment), electronic mail, electronic transfer of funds and interbank services, electronic reservation services, teleconferencing and network management. Today European standards have been established for all these areas.

3. **Mobile services**. The first European digital network, GSM, a mobile telephone system operating on a 900 MHz frequency, was established in 1991. The GSM technology is currently a very dynamic market niche in the three countries of the study.

4. **Services via satellite**. Although not a new technology, these services have not become widespread in Europe in view of the restrictions established by corresponding legislation.

5. **ISDN** (Integrated Services Digital Network), which not only upgrades existing infrastructures, but also reinforces telephone services, offering integrated access to services currently separated e.g. local telephony and various forms of data transmission.

6. **ATM** (Asynchronous Transfer Mode) which is the final technological step of integration of a broadband network. The ATM system permits high-speed communications between remote local networks and this very year (1996) it is being consolidated as an essential network technology in view of its capacity of response to requirements such as real-time video-audio applications, high-speed transmission, client/server models, image processing, groupware, multimedia transmission processing, etc.

The technological trends and the development of the service sectors described above are producing a growing convergence between EDP, telecommunications and the audiovisual sector, with major implications, not only from the business angle, but also from the point of view of vocational competencies.

The telecommunications sector in Europe has been affected by the full impact of progress towards the information society. A radical transformation of industrial cycles and a parallel transition towards an open, global market are taking place. It is not merely a question of technological change although the technology of the telecommunications industry, and in particular digitisation, are a driving force in this context.

The internationalisation of the market and the pressure of competition are triggering the following trends in the European telecommunications sector:

- A major development of corporate communications using network technology.
- A growing demand for mobile telecommunications.
- A shift in value-added from physical structures (hardware, networks) to intangible services (EDP applications, contents). The main commercial competition is therefore among service suppliers, which also constitutes the principal business sector.
- A growing convergence is emerging between services and technology.
- The demand of the market is the driving force of the trends in the telecommunications sector, as witnessed from the increase in mass video or internet communications, largely meeting a spontaneous type of demand.
- Since hardware and services must be competitive in terms of price and quality, it is necessary to reduce prices and constantly upgrade their services and user-friendliness.
- EDP, already a universal tool in firms, including SMEs, is very rapidly transforming into an intercompany medium of data communication and exchange.
- Telecommunication networks have to advance towards a greater degree of "intelligence" to be able to serve multiple purposes in view of the need for increasingly precise, rapid and customised information.

In this phase of market internationalisation, closely linked to the establishment of the information society, information is the crucial product: the elaboration of contents, its structuring, processing, distribution and storage. The creators of contents (the film industry, film studios, entertainment producers, software developers) and content distributors (on-line services, television stations, cable, satellite and telecommunications operators) are the market protagonists. Those players able to develop interactive applications will also gain an important position within this market, making it necessary to clearly identify people's information and communication needs and, within these needs, spontaneous demand.

3. OCCUPATIONAL CHANGES

3.1. In administration/offices

As already indicated above, extremely significant technological changes took place in offices in the 1980s and early 1990s with a considerable impact on working methods in administration and the skills of the employees in this field.

The appearance of spreadsheets, interactive accounting systems and new word-processing applications considerably expanded the functions and occupational profile of administrative workers. With the previous EDP systems, administrative workers typed texts or inputted accounting data which was then submitted to the supervision of their superiors. Nowadays accounting and other data are registered on-line and workers must be able to use computers, local networks and frequently even geographical networks.

The new administrative workers therefore not only have to be able to keyboard texts or perform accounting tasks on their computers but also have to be familiar with multiple aspects of the operations in which they participate. For example, an accounting assistant responsible for the accounts of a firm marketing investment goods has to be familiar, not only with sales and purchases accounting, but also the accounting procedures of the suppliers, the costs of materials and manpower, whether the hardware is manufactured by the firm itself, customs duties in cases of export, depreciation costs, etc. This means that anyone working in the administrative field must be familiar with the complete working process, taking decisions on its various aspects and keeping in constant contact with those performing different tasks in the operation (e.g. procurement, shipping, distribution agents, financial agencies, etc.), competencies previously the exclusive preserve of executives or area managers.

These changes in occupational profile have a range of consequences for the work of administrative employees and the new competencies required, the most important being:

- A fall in the demand for lesser skilled manpower in view of the decline in auxiliary tasks and the automation of routine work.
- Social and interpersonal skills have become a priority requirement for administrative work which involves ongoing interaction with clients, users, suppliers, employees from other company areas, official agencies, etc.
- Knowledge of business activity and the process of production have become indispensable since the new administrative role implies intervention in the process as a whole.
- Training must involve a greater degree of multiskilling and, alongside traditional specialised administrative knowledge, must include a broader knowledge base, notably language skills, including knowledge of foreign languages, economics and social sciences.
- Computer literacy is indispensable; this includes both individual PC applications and the use of networks for the various tasks ranging from electronic mail to interactive accounting or management programmes.
- All these competencies must be backed up by a personality capable of making decisions, taking the initiative, ensuring the exactitude of data and adapting to different situations and interlocutors.

These changes in occupational profiles and competencies were equally evident in all three Member States, suggesting the hypothesis that IT - or to be more precise the consequences of the information society and the internationalisation of markets - has a similar impact on the competencies of administrative workers, regardless of geographical circumstances.

3.2. In telecommunications

The field of telecommunications is a technology-intensive sector in which until recently non-technological knowledge was of little relevance. But this situation has changed radically in recent years and today professionals hitherto strangers to this field - e.g. marketing experts, documentation officers, information science specialists or service planning experts - are now finding employment in the telecommunications sector.

This changing situation is the result of various organisational changes imposed by the requirements of the market. The first of these changes was the need for the transition from highly hierarchised structures to multidisciplinary project groups with a lifetime limited to the period of project implementation.

Alongside the businesses giants, a multitude of firms have set up operations in the telecommunications sector whose characteristics, in terms of their size, organisation and effective utilisation of human resources, are more adapted to the market/product.

Project groups are generally comprised of a small number of persons from various specialised fields, led by a project leader, a programme analysist and a network designer with experience as technical advisers and various transversal functional activities e.g. a systems expert, a marketing expert and a quality controller.

The appearance of the marketing expert in this sector should be emphasised. Until several years ago, telecommunications companies specialised in high tech only needed to concentrate on the product. Market trends towards deregulation, the end of the monopoly and internationalisation have made them turn their attention to three other aspects of marketing: the price, distribution and promotion/advertising of the product. In this sense, the competencies required from a marketing expert are more similar to those of a marketing technician in firms manufacturing large-scale consumer products than to those of a telecommunications product specialist.

In any case, this trend towards the introduction of project groups within the telecommunications sector has triggered a demand for new job competencies:

- Firstly, all the members of a project team need to deepen and upgrade their organisational and management abilities since they can no longer expect solutions to come through the hierarchy or from outside the team.
- Secondly, professionals must be able to substitute their functions for those of any other member of the team and assume different tasks; this calls for multiskilling and a considerable degree of adaptability.
- Thirdly, learning ability is indispensable so that professionals in this field can permanently upgrade their know-how. The ability to obtain and handle

information, the "raw material" of work in this field, is particularly important in this context.

- Last but not least, interpersonal skills are of key importance in this new occupational profile since those working in this field have to attend to an increasingly diversified clientele and may be called upon to assume different roles in each project - project leader, financial or human resources manager or merely a technician implementing plans. These interpersonal skills include a range of diverse aspects, e.g. the ability to listen, to manifest empathy, to work in a team, to motivate others or to precisely express one's wishes to interlocutors.

These competencies must be combined with the technological competencies and each professional must become specialised in a wide area, ranging from information to audiovisual matters. However, as repeatedly observed at experts meetings, it is above all the personal profile combining this set of personal, social, organisational and technical competencies which defines this new occupational profile.

Despite the evident features of this new occupational profile, in conclusion to this section it must be admitted that it was relatively difficult to define the functional activities and the contents of professions in terms of competencies within the telecommunications sector. This is on the one hand due to the definition of an insufficient number of present typical jobs and on the other hand the enormous functional changes currently under way. It was therefore necessary to use the rather abstract concept of related functional activities which refer not to concrete occupational profiles, but to macroprofiles combining various functions within the same functional area.

4. INITIAL TRAINING AND THE LEARNING ORGANISATION

Another observation made within the framework of the study is not only the considerable importance of initial training for work within the IT field, but also the change in the division of responsibilities between the education system and industry in this respect.

Firstly, the trends in work triggered by the impact of IT both in administration/offices and telecommunications have led to a rise in the threshold or minimum level of initial training required. In fact, in the three Member States examined, it is becoming increasingly difficult for those holding certificates below the levels of the upper secondary-school leaving-certificate or middle-level vocational training to find jobs in this field.

This rise in training level requirements is even higher in the telecommunications field since the access requirements for the majority of the related functional activities include at least post-secondary (level 3) training (BTS in France, Téchnico Superior in Spain and Lauree-brevi in Italy). Moreover, in various interviews, experts indicated the suitability of university graduates, regardless of specialised field, for those related functional activities requiring a high degree of multiskilling or to perform functions in the project, planning and research fields.

Another aspect which should be emphasised with respect to initial training is that although the impact of IT in this occupational profile calls for the acquisition of new technological knowledge, it at the same time requires an enhancement of skills in

terms of those which have always been basic competencies to be acquired in general education, e.g. oral and written expression, knowledge of the world around us and the ability to think. This may seem logical in a field in which the raw material is information and the work basically consists of compiling or distributing this information. Yet it is significant that IT is once again demanding these basic competencies which can be found in the most traditional of schools. This observation should also draw attention to the risk of educational reforms almost exclusively designed to upgrade technological training - although this is undoubtedly necessary - without due consideration to basic general education.

However, no matter what the quality of initial training, it alone cannot satisfy the training demands of sectors in which IT exerts a strong influence e.g. administration and telecommunications. One basic skill requirement is the ability to learn and permanently update one's own know-how. This illustrates the need for continuing training for each of the functional activities.

However, much of the new knowledge to be acquired can only be found in the undertakings. Moreover, much of this knowledge, insofar as it involves complete production processes, is not only to be found in the mind of a single professional. Knowledge and information, therefore, are to be found in the organisation as a whole; the organisation is thus the only location which can guarantee the necessary continuing training. This observation calls for firms to assume a training role and adopt a conscious human resources policy, always leaving an opportunity for learning in each phase of the production process.

All the experts stressed the need to institutionalise continuing training and emphasised as the most important models self-directed training and ongoing updating training on the basis of the specific contents of one's activity. However it was also observed that with the exception of large telecommunications enterprises, the remaining firms, above all SMEs, do not tend to institutionally guarantee continuing training which is left to the personal initiative of each worker.

5. AN EMERGING CONTEXT: "GROUPWARE"

The experts also underlined the fact that the more flexible the organisation, the more continuing learning capacity it demands of its employees. The research team also asked what type of IT could assist this process of in-service continuing training. In particular, it considered a new technological solution developed by the computing market, known as "groupware". This solution potentially covers a high number of working situations in which, on the basis of IT, workers can develop a value-added from teamwork. Groupware is still a limited technological resource requiring further development, designed to promote flexibility and interconnectability.

On the basis of their emerging applications, interactive communication networks and systems allow the sharing of knowledge, thus overcoming the isolation of specialists working alone on their own computer systems. The development of this process of knowledge-sharing may be considered as the logical basis of groupware.

The EDP methods, solutions and instruments defined as groupware offer an interesting perspective for the design of innovative training models and the

integration of training in organisations. Groupware also offers an interdisciplinary approach which can promote interactions and cooperation within the organisation and with other organisations. The groupware philosophy is an essential element of the learning organisation, discussed above, insofar as it guides and promotes the ongoing process of organisational adaptation to changing situations inside and outside the undertaking. By promoting the exchange of information and ideas, groupware promotes teamwork within a less hierarchical organisation.

It is not yet exactly clear what the contribution of groupware is to be in terms of more open and flexible solutions and the multiple and complex connections it may provide for the occupational life of project groups and organisations. Workers in new working contexts using new technologies must regard their field of activity as an integrated system and be able to interpret events, adapt, understand, learn and cooperate. The new groupware technology undoubtedly opens up interesting opportunities for the development of all the competencies so frequently recorded in the study.

6. THE SIMILARITIES AND PECULIARITIES OF EACH COUNTRY

One observation of enormous interest was the fact that the principal trends in terms of the competencies required by the telecommunications sector and in administration are similar in all three countries. Although the countries involved are clearly EU members with major convergences in many respects, this observation is highly important with reference to an exchange of ideas and projects in the field of training. From this point of view, it confirms the initial hypothesis of the research team that there may at least be a number of common typical macroprofiles for which a number of similar "training" strategies could be drawn up.

The differences between the three Member States essentially lie in two areas: the different degree of IT implantation in each country and the very different occupational classifications, not only from country to country, but also within the same country. This is particularly true of the telecommunications field.

For reasons of market proximity and in view of what has already been mentioned concerning competition imposed by the internationalisation of the market, a growing convergence can also be found in the pace of technological and organisational innovation. Sometimes there are greater differences between more or less dynamic firms or more highly or less developed regions than between countries.

III. RELATED FUNCTIONAL ACTIVITIES (RFAs) AND VOCATIONAL COMPETENCIES IN THE TELECOMMUNICATIONS AND ADMINISTRATION SECTORS

1. PRELIMINARY EXPLANATORY COMMENTS

Telecommunications and administration were chosen as the subject of this study because both these sectors are clearly facing profound changes in their requirements in terms of vocational competencies and their organisational structures in the wake of the continued advancement of IT.

When the study was begun, it was clear that work dynamics and organisation differ from firm to firm, that highly innovative business situations exist side by side with more traditional ones, some more open to functional multidisciplinarity, others more focused on hyperspecialisation. This fact added a degree of uncertainty to any generalised proposal of related functions.

In each country therefore the available documentation was used to design an hypothesis of functional area sequences and a list of RFAs. This hypothesis was discussed and finalised within the work group. When it was submitted to the experts for their opinion, a number of changes were made to the list of the RFAs.

An even more complex problem was to match the RFAs selected with the very different denominations given to the persons carrying out the various functional activities in the firms. Frequently, within the same country, different names are given to those performing similar functions whereas functions with very different denominations are in fact the same.

Given this degree of uncertainty, it was decided to raise the analysis to a first level of abstraction. This involved individualisation of the RFAs, starting out from what can be regarded as their vocational tasks without regard to the concrete organisational contexts of the firms in question. The RFAs therefore do not identify concrete tasks, but macroprofiles which include new vocational, personal and social competencies in the wake of the introduction of IT.

The RFAs are classified according to functional areas. In the following, a descriptive chart is presented for each RFA which includes the following sections: definition of tasks - new vocational, personal and social competencies - access requirements in terms of training level and experience and continuing training arrangements.

Each RFA is presented with an indication in brackets of the letter identifying the country in which it was identified.

2. THE TELECOMMUNICATIONS SECTOR

2.1. FUNCTIONAL AREA: STUDIES, PROJECTS AND PLANNING

The task of this area is the planning and implementation of management systems and tools on telecommunications networks and services. It is characterised by a high level of technological specialisation and a rapid pace of development. Moreover, projecting telematic networks and supplying software for telecommunications implies the ability to forecast market trends to constantly provide the most competitive services and products. It similarly implies the implementation of a total quality programme, achieved when competitive advantages are established in the production cycle, in the management of innovation and in terms of client satisfaction.

RFAs in this area

It was difficult to define the RFAs in this area in view of the different denominations used and the lack of definitions or overlapping functions within the various activities. For this reason our attention was limited to those functions involved in the provision of services, engineering tasks, procurement or supplies and quality control. The three most important functions found in this area are: network designer/planner, telematic systems analyst/programmer and systems manager.

A. Network designer/planner[1] (E, F, I)

The network designer/planner has the task of designing networks, defining the resources to be deployed, designing network architecture, drawing up technical plans in accordance with the projected demand for the services and traffic and guaranteeing quality standards and realisation times.

a) New competencies

Vocational competencies

From the occupational point of view, the following competencies and knowledge are required from network designers in view of technological trends:

- Design of new network architectures.
- Use of new techniques and supports for network and systems design.
- Integration of new services and media in project development (ISDN, multimedia) with the required type approval, quality and safety standards.
- Coordination, supervision and evaluation of technical work throughout the various project phases.

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1 E=Spain; F=France; I=Italy. This refers to the countries in which the RFA was identified.

Personal and social competencies

Recent organisational models in the telecommunications field geared towards project work and the resulting need for a greater degree of multiskilling highlight the importance of the following personal and social competencies for this function:

- The ability to cooperate in group projects.
- The ability to adapt to role changes within the organisation.
- A distinct aptitude to obtain information and the ability to learn.
- Communication and interpersonal skills.
- The ability to organise and coordinate teamwork.
- Result and client guidance.

b) Access requirements

These abilities are based on a high level of initial, general and technical training, and are also the result of vocational experience.

A technical or scientific university degree is therefore required for access to the profession of network designer/planner. This need not necessarily be in telecommunications or computer science - what is really necessary is a high-level scientific and technical educational background unto which this specialised field may be grafted and this can be done on the job. A period of experience or training alongside other experienced designers is also required. Command of English, the vehicular language in this sector, is indispensable.

Finally, the human factor, as described above, is essential for access to this profession.

c) Continuing training

Continuing training is indispensable for network designers. It generally takes the form of self-directed learning or may be assisted by special events organised by the firm, the latter being more frequent in the case of national or multinational firms which tend to have their own updating training structures.

The main contents of continuing training are generally: innovations in network technology and telecommunications software, international technical standards and norms, network safety, business management and organisation.

B. Telematic systems analyst/programmer (E, F, I)

The telematic systems analyst/programmers have the task of seeking and developing customised telematic solutions and systems. They develop adequate software and hardware, information systems and systems utilisation standards. In recent years they have increasingly had to integrate different environments and systems, applying different methods and the appropriate technologies for new organisational models.

Multiskilling and multispecialisation are increasingly expected.

a) New competencies

Vocational competencies

The competencies of this function are not dissimilar to those expected of network designers or planners since the work of telematic systems analysts/programmers is also geared towards the implementation of concrete projects in various types of firms and organisations. In concrete terms, the following basic competencies and knowledge are required:

- Solutions design (integrating different methods, processes and techniques) meeting the requirements of the corresponding communications system.
- Software development for the specific environment.
- Elaboration of user manuals, listing installation, maintenance and service specifications.
- Management of set-up work.
- Participation in systems trials and testing.
- Organisation, follow-up and supervision of the system.

To perform these tasks, specialised knowledge of various functions is required, advanced programming, languages, analysis methodologies, etc. Like the previous RFA, knowledge of English is indispensable.

Personal and social competencies

These are largely similar to those required of network designers:

- Flexibility and adaptability to assume different organisational roles.
- Creativity or the aptitude to continually seek new solutions.
- A considerable ability to learn and obtain information with a view to ongoing self-directed updating training.
- The ability to work in a team.
- An excellent ability to relate and listen to others.
- Result and client guidance.
- The ability to motivate and coordinate work groups.

b) Access requirements

The knowledge necessary to develop these competencies are interdisciplinary and high-level. Access to the job of telematic systems analyst/programmer therefore requires a university degree, preferably in a technical or scientific discipline, and a solid grounding in computer science. A university degree in itself is not sufficient. The personal profile described above is fundamental and very important to employers. It is also indispensable to spend at least one or two years working alongside an expert professional in this field before assuming full responsibility for the projects.

c) Continuing training

Continuing training is very important for this professional, above all knowledge of market trends with reference to technological systems and communications software. Updating in certain aspects of business and commercial management is also necessary, in particular to with a view to familiarisation with the demand for information and communication developing in the various economic, social, cultural, etc. fields. Self-directed learning is the most frequent form of continuing training although some firms promote specific training actions.

This continuing training must also serve to retrain graduates, e.g. analysts and programmers in traditional areas whose initial training has become obsolete in view of new engineering systems methods and software. In fact since these professionals are facing very serious problems in the labour market, their training must be urgently redirected towards a new form of know-how which is very much in demand in the market but requires new vocational competencies.

C. Systems manager (I)

Network systems managers deal with the operational functioning of development systems and telecommunications networks. The basis of their activities are technical operations and processes designed to ensure smooth machinery operation and the maintenance of standards.

Although these professionals belong to this functional area, they have transversal competencies so that they can collaborate in the implementation of interfunctional studies and projects. In the new project-oriented organisational structures, the systems manager is not always a member of the laboratory or study group, but often the person who intervenes at the point of systems configuration or functional verification of software.

a) New competencies

Vocational competencies

The transversal character of this function, the high degree of interaction with other professionals and the fact that these persons have to intervene within a large number of systems mean that they have to pay

considerable attention to technological innovation in this sector. The following vocational competencies and knowledge are expected from systems managers:

- Specialised interfunctional knowledge.
- Knowledge of advanced programming languages.
- Knowledge of new methods of software functions verification.
- The ability to solve problems.

Vocational and social competencies

Like the other professionals working in project areas, the competencies required from systems managers are fundamentally characterised by a high degree of flexibility:

- A high degree of flexibility when intervening in the various project phases.
- Adaptability to work in different projects.
- Communication skills.
- Result orientation.
- The ability to work in a group.
- The ability to relate to others.

b) Access requirements

Access to the profession of systems manager requires a university degree in a scientific or technical discipline, previous work experience with other expert professionals and knowledge of English.

c) Continuing training

It is very important for the systems manager to be constantly up-to-date with the new technologies available in the market.

Self-directed learning is the most frequent form of continuing training in this profession, although participation in training actions organised by systems managers' own firms or suppliers can also be found.

2.2. FUNCTIONAL AREA: INSTALLATION, OPERATIONS AND TECHNICAL ASSISTANCE

Within the telecommunications production process, the main tasks of this functional area are the installation of new hardware and networks, set-up of services, network/systems management and maintenance and technical assistance.

Since this area is characterised by technological innovation, it is necessary to update and in many cases upgrade the skilling of its professionals. The introduction of optical fibres to the transport network, and above all network digitalisation, require installers and administrators to have knowledge of software and the upgrading of supervisory and operational methods, using monitors and keyboards.

Occupations in this area are going through a major process of transformation in view of the following factors:

- Many operational and maintenance services are being outsourced to reduce costs.
- Lesser-skilled occupations are disappearing on account of services automation.
- Maintenance services are gaining in importance.
- The utilised software and its maintenance are gaining in importance.
- The emphasis is on productivity - with the trend towards only one technician responsible for the entire production process and quality - demanding an increasingly high level of skilling from technicians.
- Multimedia teams and on-line services are spreading.
- Back-up activities and technical assistance for users are increasing in importance.
- The new network architectures and hardware must be constantly updated in terms of knowledge of network organisation and administration, quality or safety.

RFAs in this area

Three RFAs were identified in this area: telecommunications installer, network manager and network, officeware and telematics maintenance operator. Each of these professionals operates in one phase of the implementation of the service and gives technical assistance to clients/users.

A. Telecommunications installer (E, F, I)

This technician carries out the installation or alteration of the physical components of the network and communications software on tne basis of technical specifications and under the instructions of a more highly qualified professional.

a) New competencies

Vocational competencies

From the technical and specialised point of view, this professional must be able to:

- Read plans, determine hardware, prepare and develop an installation plan.
- Design and set up new installation configurations.
- Respond to systems alteration requirements, replacing the hardware, altering the software and training clients.
- Diagnose operational errors and change the standard hardware, drawing up the new configuration.

The knowledge required to develop these competencies is predominantly technological in nature: knowledge of telecommunications hardware, intercommunication, commutations, network architecture, word, image, text and data transmission, materials, calibration and testing of hardware, electronic systems technology, graphic representation and

international installation standards. A further requirement is knowledge of the occupational and business environment in question.

Personal and social competencies

These are very important for this professional and include, among others:

- Adaptability to different working situations.
- The ability to organise one's work.
- The ability to work in project groups.
- Initiative and independence in performing one's work.
- A sense of responsibility and the ability to appreciate the economic and legal consequences of one's actions.
- The ability to relate to others and communicate with clients.

b) Access requirements

Access to the profession of telecommunications installer requires a middle- or higher-level vocational training certificate or vocational secondary education, both with a technical leaning. Courses leading to certificates related to the profession (telecommunications, computer sciences, audiovisual) whose contents have been updated by recent reforms are to be found in each country. This initial training is generally rounded off by specific in-company training. A further requirement is the ability to read and understand technical documentation in English.

c) Continuing training

The growing sophistication of the hardware in this field requires these professionals to acquire continuing training above all in the following fields: new installation techniques, new commutation hardware and network standards, new voice, image and data transmission systems, telecomputing, specific software, optics, acoustics.

The firms themselves frequently organise continuing training events for these professionals, which are complemented by self-directed learning.

B. Network manager (E, I)

Network managers manage and coordinate network resources (including hardware and software) and systems operations and are responsible for network output control, data protection and security, traffic administration, authorisation of user network facility access and assignment, identification of points of interruption and re-establishment of communications and definition of network and media requirements.

The competencies required from network managers differ, depending on whether they operate in a large or small-scale network. In the case of larger networks, they will mainly be involved in traffic control and classification, whereas in smaller configurations network administration is a complement to systems supply, involving intervention to match the service with clients' needs.

In general, network managers' tasks are becoming less complicated due to the gradual process of network automation, giving these professionals an essentially supervisory role.

a) New competencies

Vocational competencies

Network managers require new knowledge and competencies to adapt to a changes in job contents, the most important being:

- Complete resources coordination and correct systems operation.
- Information supply and network quality control.
- Knowledge of new communication hardware and systems.
- Knowledge of new alarm systems.
- Knowledge of new surveillance criteria.
- Knowledge of new intervention criteria.

Personal and social competencies

The personal and social competencies currently most useful for this occupation are as follows:

- The ability to work in isolated locations.
- A sense of initiative to choose between different types of intervention.
- A high degree of responsibility.
- Self-control in critical work situations.
- The ability to update one's professional knowledge.
- The ability to manage interpersonal relations.
- Communication skills

b) Access requirements

Access to the profession of network manager requires a higher-level technical vocational training certificate, as well as at least average knowledge of English. Some experience working alongside professional experts in network administration functions is also indispensable.

c) Continuing training

Continuing training, indispensable for this profession, is generally delivered by the company itself. Updating training is particularly necessary in the fields of international standard systems, data protection and safety in information systems.

C. Network, officeware and telematics maintenance operator (E,F, I)

This professional is in charge of preventative and corrective network, officeware and telematic systems maintenance, substitution of defective parts, verification and start-up of the hardware/software configuration and advising clients on its use and operation.

a) New competencies

Occupational competencies

To perform these tasks, these professionals must be up-to-date with both technological innovation and business organisation. This requires the following knowledge and vocational competencies:

- Knowledge of the functional characteristics of the network and new hardware and systems.
- Application of new diagnostic techniques.
- Knowledge of new maintenance procedures.
- Set-up of new hardware and software configurations.
- Organisational structure and standards.
- Interpretation of technical documents.

Personal and social competencies

These are an essential requirement for this professional, the most useful being:

- The ability to quickly answer clients' questions.
- The ability to learn and obtain information.
- Flexibility and adaptability.
- The ability to solve problems.
- A sense of responsibility to appreciate the economic and legal consequences of one's acts.
- The ability to communicate with clients.

b) Access requirements

Access to the profession of network maintenance operator requires a middle-level technical vocational training certificate. Specific certificates leading to this occupation are to be found in each of the countries. Sound knowledge of technical English is also required. Initial training is usually rounded off by specific in-firm training to develop maintenance competencies.

c) Continuing training

Continuing training is closely related to technological trends available in the market; it is usually organised by the firm itself or by suppliers.

The most essential training subjects are updating in new communication systems, international hardware and network standards, data protection and communication safety systems and customer services.

2.3. FUNCTIONAL AREA: MARKETING AND SERVICES SALES

Within the production process of firms supplying telecommunications services, the functional area of marketing, services sales and technical assistance is responsible for various types of activity:

- Pre-sales which implies, on the one hand, a strategic approach to the business, and, on the other, an analysis of the conditions of services supply and information and counselling services for clients.
- Sales, of either the passive type, waiting for clients to put in orders with the offices or sales points, or more active sales activities consisting of canvassing clients via campaigns or other media. The sales process also includes connecting the client to the telecommunications network and charging for the services rendered.
- Post-sales, involving technical assistance to the client to solve problems occurring in the utilisation of the service. Key or profitable accounts tend to be given specific attention and special counselling to help find optimal solutions.

From the occupational and organisational point of view, this area is going through a process of major transformation. There are a number of reasons for this, among others:

- The constant emergence of new products and services linked up to new types of terminals.
- The majority of these products are marketed in a competitive market, breaking with the traditional concepts prior to the liberalisation of telecommunications, e.g. regulated tariffs, captive markets, terminal, network and service operation or identification monopolies.
- Marketing strategies are highly sophisticated: each service has its own potential market, hardware and sales conditions.
- Network hardware and components are frequently remote from the worker who sees them from a distance by means of computer interfaces and therefore has a completely new relationship with them.

These factors are changing the culture and internal procedures of telecommunications firms, especially in this area.

Reference should also be made of the emergence of electronic information services enterprises offering services such as "megafax" or voice transmission via radio, international data transmission, voice mail services, electronic mail and videotext. Cable television, a market in which a fierce trade war is expected, would merit an entire chapter to itself. The production process in these firms generally follows a

series of typical phases: a) information identification and capture - b) database design - c) systems development - d) update of content- e) marketing and sales - f) general administration.

This overall production process requires the technical contribution of professionals who have recently appeared on the telecommunications stage, e.g. marketing experts, documentation officers, information science specialists or experts in the contents of the relevant service rendered.

RFAs in this area

Three main professionals were identified in this area: marketing and strategic development manager, sales and commercial development agent and documentation officer.

A. Marketing and strategic development manager (E, I)

The task of this technician is to design strategic studies and economic forecasts on the use of telematic networks and services, to select the most appropriate products and suppliers and the best sales methods for each market segment.

There is a rising demand for this function in this sector, both in firms which are network operators and those supplying value-added services.

This professional's task is not only to provide certain specialised services, but also to stimulate the organisational culture: s/he must think in the long term, supply analyses of various scenarios, investigate the consistency of decisions, perform concrete studies, verify the strategic position of the firm, etc.

a) New competencies

Vocational competencies

From the technical and specialisation point of view, the marketing and strategic development manager must have the following competencies:

- The ability to make forecasts and knowledge of forecasting methods (econometric models trend analysis).
- The ability to draw up a sound technical and economic analysis of market conditions and the firm's capacity to position itself in the marketplace.
- The ability to select the telematic services and products best suited to this analysis.
- The ability to develop a sound production and marketing strategy.

Implementing these competencies requires high-level interdisciplinary knowledge, mainly in the following fields: marketing, sales, business economics and knowledge of the telematic hardware and services in the marketplace.

Personal and social competencies

This technician, working in a context of interdisciplinarity, must also show a high level of personal and social competencies which are essentially as follows:

- A permanent willingness to learn.
- The ability to listen and communicate.
- The ability to cooperate in projects and group tasks.
- Flexibility and adaptability.
- An excellent ability to manage interpersonal relations.
- Considerable ability to obtain and select information.
- The ability to grasp things quickly, to analyse and summarise.

b) Access requirements

In the dynamisation of all these competencies, experience and professional maturity play a very important role and are indispensable to perform tasks in this field.

The level and variety of knowledge involved in this profession makes it advisable for this professional to have a university degree. In principle, a degree in any subject will suffice if the candidate has the above-mentioned competencies and the adequate knowledge since the personal profile and vocational experience are the most important criteria. However a number of university degrees are particularly appropriate for this position, e.g. economic and business science, law, marketing, sociology, telecommunications. A sound command of English is also required.

c) Continuing training

Continuing training is absolutely indispensable, principally in the following fields: knowledge of new and emerging telecommunications products and services, updating in market research techniques, in various aspects of business economics, modes of behaviour and and cultural habits of people in the workplace, leisure time, etc.

This continuing training in generally acquired by means of self-directed learning.

B. Sales and commercial development agent (E, F, I)

The tasks of the sales and commercial development agent are analysis of needs and motivations, advice, sales and attending to present and potential clients in relation with the hardware and services offered by the telecommunications undertaking.

Since sales activities are conducted at different levels of the decision-making process, these professionals are known under many names. Their tasks have become increasingly complex since clients have become more discerning and in view of the sophistication of the technology and the business.

a) **New competencies**

Vocational competencies

From the technical and specialisation point of view, sales and commercial development agents must be able to:

- Develop sales operations for telecommunications services in accordance with the market strategies developed by the firm and market trends.
- Attend to clients' requests for services and provide advice on these services.

These competencies require precise knowledge of three main areas: characteristics and functions of the hardware and services sold, sales techniques and commercial regulations in this sector. This knowledge must be clear and operational in concrete situations.

Personal and social competencies

The main personal and social competencies required for this position are as follows:

- The ability to listen and understand clients' requirements.
- Capacity of self-motivation and the ability to motivate others.
- The ability to negotiate.
- Communication skills.
- Motivation and conviction of what one is doing.
- Personal initiative.
- The ability to permanently update one's professional skills.

b) **Access requirements**

The sales agent requires a high-level technical vocational training, preferably technical university training. However the personal profile is more decisive for this job than certification. Personal maturity and vocational experience in various company areas are the most useful tools. Knowledge of English is also required.

c) **Continuing training**

In view of the frequent technological innovations and increasing competitivity, continuing training is necessary for those involved in telecommunications services sales. The most important areas requiring updating training are: functional knowledge of new telecommunications services and hardware, sales techniques, customer motivation, customer relations and the latest corporate strategies.

C. Documentation officer (E)

The task of the documentation officer is technical identification and administration of information, identification of sources, acquisition management, participation in database design, updating contents and attending to specific queries from clients.

There is an increasing demand for this transversal position which is new to the telecommunications field and specialised in the management of information content. The role of the documentation officer is strategic to firms offering this type of service.

a) New competencies

Vocational competencies

From the technical and specialisation point of view the documentation officer must be able to:

- Develop information management projects within given thematic areas.
- Collaborate with computer science and telecommunications technicians in the design and management of telematic systems.
- Design and update databases containing the information to be distributed.

To put this knowledge into practice, substantial theoretical training is necessary, as well as knowledge of librarianship, documentation, cataloguing, computer applications of documentation, languages and specific knowledge on the content of the administered information.

Personal and social competencies

The most useful in this profession are:

- A systematic approach.
- Learning ability.
- The ability to cooperate in group projects and tasks.
- The ability to communicate with others.
- Attentive capacity.
- Consistency and persistence in seeking information or answering queries.

b) Access requirements

The work of a documentation officer in this area requires an academic university degree in librarianship and documentation, a command of languages and some previous work experience alongside professional documentationalists, not necessarily in this specific field.

c) Continuing training

Ongoing continuing training is indispensable since documentation officers work in an environment constantly affected by innovation. The most usual channel is self-directed learning. Updating training is particularly important in the following areas: computer applications for documentation, knowledge of the thematic areas dealt with in the workplace, new information techniques.

3. THE ADMINISTRATION/OFFICES SECTOR

3.1. THE PROBLEM OF SEPARATING FUNCTIONAL AREAS AND RFAs IN ADMINISTRATION/OFFICES

Work in administration/offices is intersectoral and, moreover, very diverse from the organisational point of view, depending on company size.

In medium-sized and large firms, administration tends to be a functional area or a department, just like the production, commercial, etc. departments. In small firms, administrative tasks are frequently performed by a single person who assumes very varied functions.

Moreover, in firms which have an administrative department, this department tends to be organised in different sections, the most frequent being general administrative services and accounts.

In a large firm or institution, the necessary information is organised and handled in different administrative units responsible for general, commercial, financial, accounting, human resources etc. administration, and processed at the level of the management bodies for decision-making purposes, whereas in small firms, one or several persons is/are responsible for the compilation, processing and transmission of all types of information.

This also applies to public administrations, institutions whose essential task is to work with information to facilitate policy decisions or the provision of public services. The main difference is that in public administrations, certain types of information, e.g. legal information, are given priority attention, whereas others, e.g. commercial and accounting, are only of interest to certain specialised administrative units.

In the light of this organisational diversity in the administration/office sector, a breakdown of this field into functional areas would only be valid for large-scale firms and not for small undertakings in which there may be only one person carrying out the functions of its various areas. For this reason, this breakdown was not applied in the analysis of the results of the Spanish and French reports where we immediately proceeded to the level of RFAs. In the Italian report, in contrast, the initially proposed division into functional areas was observed and, within these functional areas, a breakdown according to RFAs, which perhaps explains the fact that there is a higher number of RFAs in the Italian report. The table below shows the lists for each of the three Member States.

FUNCTIONAL AREAS AND RFAs FOR EACH OF THE THREE MEMBER STATES

SPAIN	FRANCE	ITALY	
RFAs	**RFAs**	**Functional areas**	**RFAs**
• general administrator • commercial administrator • secretary • accounts administrator • human resources manager • public relations administrator	• administrative employee • secretary • accounting assistant	• administration/ accounts	• general accounts officer • analytical accounts officer • administrative employee
		• general/secre-tarial services	• secretary/executive secretary • switchboard/ • telephonist • documentation classification and reproduction officer
		• administration/ finance/ • management control	• management and budgetary control manager • financial analyst • auditor
		• human resources management	• personnel manager • training manager
		• legal/fiscal	• legal office manager • fiscal office manager

In view of the diversity of the results of the three national reports, for the purposes of the present summary report, we have conducted a new comparative analysis of the tasks of the various functional areas and RFAs, avoiding repetition and tending to retain those involving a particular degree of multiskilling, which is the trend of working activity in the in administration/office sector in the three Member States.

The list of RFAs which emerged from from this analysis, whose descriptive charts are presented below, are as follows: administrative employee, secretary, accounting officer, human resources manager, commercial administrator and public relations administrator.

Positions with very specific tasks, e.g. switchboard operator or documentation classification and reproduction officer, have not been included in the analysis, these being functions which are being absorbed by more multiskilled positions. Specialists such as the auditor, legal office manager or budgetary control manager were also excluded.

In any case, this difficulty in classifying the RFAs is indicative not only of the wide organisational diversity of administrative work according to the type of firm, but also the profound changes affecting offices in the wake of the introduction of IT and new management systems.

3.2. LIST OF RFAs

A. Administrative employee (E, F, I)

Administrative employees are responsible for a series of administrative operations which constitute part of the procedures (cf. information, orders, invoicing, dispatching, complaints, documentation register, etc.) upstream or downstream of manufacture and delivery of a product or service by an undertaking or a public administration.

The general purpose of all these operations and procedures is to centralise and organise all the information in compliance with the standards to be observed in the production or performance of the relevant service.

This is therefore an extremely multiskilled activity in terms of its functions and competencies. The work of administrative employees is generally facilitated by IT which offers automatic registration and on-line availability of the necessary information throughout the entire service process.

a) **New competencies**

Vocational competencies

From the technical and specialisation point of view, the administrative employee must be able to mobilise the following aspects of general knowledge in a practical form, i.e. must be in a position to:

- Inform clients about the service in question.
- Register and record ongoing operations.
- Administer follow-up of services rendered.
- Attend to complaints.
- Administer various matters related to the service: personnel, banking, storage, orders, contracts, etc.

The basic skills required for this work are: drafting and editing, use of documentation related to the service as a source of information, calculation, accounting, typing and computing (PC and networks) at user level, knowledge of business legislation and, increasingly, at least one foreign language.

Personal and social competencies

As far as the necessary personal and social competencies are concerned, the most important are aspects related to communication skills:

- The ability to communicate.
- The ability to respect processes and conventions acceptable in the environment.
- The ability to understand the urgency of attending to matters requiring attention.
- The ability to listen.
- Discretion regarding matters handled.
- Good client relations: a good business image, continuity of service, flexibility.
- An aptitude to cooperate and work in a group.
- Verbal and numerical memory.
- Care and precision in dealing with data.
- Self-control.

b) **Access requirements**

The administrative employee function requires at least the equivalent of the upper secondary-school leaving-certificate or vocational training in the field of administration and management. This initial training is generally supplemented by a brief period of in-service training on the tasks to be accomplished within the firm.

The position of administrative employee tends to be regarded as the first step on the administrative career leader, although in practice promotion opportunities are infrequent for those with low levels of initial skilling.

c) Continuing training

Continuing training is required by all administrative employees, the main fields for updating training being: computer programming for administration and networking (electronic mail, specific applications, etc.), public relations techniques, business organisation, administrative legislation, languages.

The normal procedure for acquiring this training is self-directed learning although specific training events are also organised by many firms and public administrations.

Employees with lower levels of education or certification also require programmes to reinforce initial training: language, calculating, social sciences, etc.

Administrative employees' promotion opportunities are towards the following positions: secretary, assistant accountant, public information officer, administrator of a small firm etc.

B. Secretary (E, F, I)

The secretary is the professional within a team of various disciplines and occupations with the task of receiving and directing queries from the outside, facilitating intervention of team members to see to these queries, ensuring communication logistics and media coordination, keeping the diaries of the work team and managing case files related to the service.

In other cases the work of this professional is to assist the management in administrative and scheduling tasks and management of communication and various delegated matters.

This professional shares a number of tasks with the administrative employee, e.g. those related to information, case file and schedule management or the provision of information to others. However secretaries also have their own specific tasks, e.g. handling correspondence, drafting documents, monitoring service activities and participating in its organisation.

a) New competencies

Vocational competencies

The tasks to be completed by this professional require multiskilled abilities and knowledge. Among others, the most important competencies are:

- Informing others about the relevant service or product and dealing with their queries as the first step in the process.

- Elaboration and follow-up of administrative case files.
- Administration of fiscal and economic resources.
- Diary organisation.
- Implementation of various administrative procedures or the production of reports to facilitate the work of a technical team or an executive.
- Carrying out various activities related to printed information: reading, interpreting and transferring mail, drafting replies, keeping the minutes of meetings, etc.

Accomplishment of these tasks requires the following knowledge: good oral and written communication skills, handling consultancy procedures, documentation and archiving, in many cases command of foreign languages, calculation, accounts, administrative legislation, typing skills and computer literacy at user level (general and specific programmes, E-mail, etc.).

Personal and social competencies

Personal and social competencies are fundamental for this activity, the most useful being:

- Good interpersonal and communication skills to assume the interface role of the secretary.
- Organisational skills.
- Initiative and independence in one's own work.
- A concern for detail and the quality of what is said and written.
- Adaptability and availability.
- Team spirit.
- Discretion concerning information handled.

b) Access requirements

Access to this occupation requires preferably a higher-level administrative vocational training certificate, in particular for certain functions such as executive and international secretarial work, for which specific diplomas are required. A command of foreign languages is indispensable, especially for executive and international secretarial work.

c) Continuing training

Although the demand for professional secretaries is on the rise, the trend, as already indicated, is towards a demand for a higher level of skilling and ongoing updating training for this occupation. The main areas of updating training for secretaries are: practical knowledge of new computer programmes used in administration, foreign languages, business training, basically in the areas in which the team in question works, and project management methods. Some firms offer specific continuing training programmes, but generally self-directed learning is required. Continuing training also provides secretaries with an opportunity of career advancement and promotion to the position of executive secretary, commercial assistant, editorial assistant, human resources management assistant, technical secretary, etc.

C. Accounting officer (E, F, I)

This professional carries out all the accounting operations of a firm or its clients, effects payments, makes declarations on social and fiscal charges, regularly draws up balance-sheets and accounting information, prepares data for decision-making and contributes to administration of EDP resources.

In view of the trend in the firms towards networking, with a single database accessible from a number of computers via a specialised application or from mobile hardware, sometimes equipped with communication modems, this professional works within an important technological environment. Legal documentation is frequently found on CD-ROM. In this field, telecommunications has become the universal medium for economic data access and transfer.

The introduction of electronic data processing tools has facilitated operations in this area. At the same time, tasks have become more complex in view of the new requirements of economic business progress analysis. At least two types of specialised functions are emerging: the general accounts officer, responsible for general accounting and the balance-sheets of the firm, and the analytical accounts officer whose task is to analyse trends in the economic resources deployed by the various areas of productive activity.

a) New competencies

Vocational competencies

From the technical and specialisation point of view, the accounting officer must be able to:

- Handle, at user level, specific updated accounting computer programmes, local, regional, etc. networks.
- Perform ongoing management operations (cost calculating, invoicing, verification of bank account status, completing economic forms, checking calculating errors, data follow-up).
- Deal with company accounting operations in compliance with legal provisions.
- Manage administrative and financial staff.
- Provide advice and information on the validity of economic and accounting documentation.

Accomplishment of these tasks is related to knowledge involving a series of competencies, e.g. good oral and written communication skills, a solid knowledge of calculation and accounts, handling of computing and communication tools, sound knowledge of administrative, accounting, fiscal, labour contractual, etc. legislation.

Personal and social competencies

These are also fundamental to this professional and include, among others:

- A permanent ability to learn.
- The ability to reason logically and argue.
- A concern for detail, a systematic approach and a sense of precision with data handled.
- A sense of commitment towards and a relationship of trust in relations with company management.
- A sense of responsibility.
- The ability to work independently.
- The ability to work in a group.

b) Access requirements

Access to this occupation requires a higher-level vocational training certificate or first-cycle university education in economics, commerce or business administration. Knowledge of English is also very important.

c) Continuing training

This activity requires continuing updating training, in particular in the following fields: updating in accounting, fiscal and social legislation, new forms of approaching (external or internal) clients, systems upgrading accounting information (e.g. via computer link-ups with clients, customized account management, etc.), utilisation of new software packages, knowledge of new products and financial services.

In general, large firms organise this continuing training, in particular when technological innovations are introduced. In small firms these professionals acquire this training on the job and by means of self-directed learning.

D. Human resources manager (E, I)

The human resources manager is in charge of personnel administration (recruitment, wages, social security, etc.), human resources planning, labour-related bargaining, contracting external services and the management of staff promotion.

Although the human resources area is growing in importance, the demand for this function remains stable. The greatest demand is for persons with higher-level certificates, experts in the fields of planning, training, motivation and personnel policy design, with which this activity is related. Human resources managers use all types of EDP officeware tools in their work.

a) **New competencies**

Vocational competencies

The following competencies are required of human resources managers:

- Legal, economic and administrative management of the organisational workforce, based on contractural aspects.
- Processing of all personnel-related information: contracts, statistics, promotion plans, legislation, etc.
- Management of new software packages related to human resources management.

Accomplishment of these tasks requires a multiskilled and relatively solid basis of knowledge, as well as specific technical training in the human resources field, knowledge of labour and business legislation, human resources policies, calculation and accounting, human relations, classification, registration and archiving techniques and business policy, structure and organisation being of particular relevance in this respect.

Social and personal competencies

Personal and social competencies are extremely important in particular:

- The ability to communicate.
- Persuasive and motivation skills.
- The ability to cooperate and work in a team.
- Flexibility and adaptability.
- Learning ability.
- Self-confidence.
- The ability to analyse and summarise.
- The ability to take decisions.
- Creativity.
- Discretion regarding the confidentiality of handled data.
- A care for detail in handling information and data.

b) **Access requirements**

In view of the broad base required for the performance of this activity, it is considered that the level of education required is the equivalent of a first-cycle university degree, preferably in labour relations, social work, economics, business, administration, etc.

c) **Continuing training**

Continuing training is fundamental for this activity, in particular in the following fields: updating training in business and labour legislation, human resources techniques (motivation, promotion, etc.), knowledge of computer applications of human resources, group techniques, training project management, business planning.

This professional normally acquires updating training by means of self-directed learning.

E. Commercial administrator (E)

This professional is responsible for the transcription and management of corporate commercial transactions. This involves a series of tasks, such as reception of orders and invoices, registration and control of supplier and client accounts, distribution and inventories, after-sales follow-up, setting of prices, rates and discounts and commercial correspondence.

There is a great demand in the labour market for this function, generally to be found in the commercial departments of medium-sized and large firms. The required competencies are similar to those of administrative employees, but more specifically geared towards specialisation in the commercial field.

a) New competencies

Vocational competencies

The commercial administrator must be able to:

- Handle various software packages related to the relevant commercial activity and communication networks.
- Handle data related to business research and marketing policies.
- Set prices, rates and discounts.
- Effect purchases and provisions.
- Manage and distribute orders.
- Provide information on clients' situations (credit lines, forms of payment, etc.).
- Perform budgetary and administrative control of commercial transactions.
- Design commercial contracts.
- Handle commercial correspondence and control advertising campaigns.

This know-how requires multiskilled initial training and at least middle-level specific commercial knowledge, e.g. commercial mathematics, business research, marketing, commercial logistics, sales and purchases management and knowledge of business and public relations. From the IT point of view, commercial administrators must be familiar with and able to handle general computer applications and specific applications in the commercial field (inventories, supplier and client management, etc.).

Social and personal competencies

The social and personal competencies required for this function are very similar to those required of general administrators, whereby three areas are particularly significant: the ability to take the initiative and decisions, the ability to maintain fluid communications and adaptability.

b) Access requirements

Access to this occupation requires at least the equivalent of upper-level vocational training in the administrative or commercial field. A period of experience in the firm working alongside expert professionals is also important, as well as knowledge of languages with which the firm has commercial relations, in particular English.

c) Continuing training

In the light of the foreseeable trends in this profession, continuing training is regarded as particularly necessary for the commercial administrator in the following fields: commercial legislation, international commerce, logistics, updating in computer applications for commercial activity, languages.

This training is acquired on the job, in courses organised by the company or by means of self-directed learning.

F. Public relations administrator (E)

Although all the previously described professionals in the administration/offices field deal with the public to a greater or lesser degree, this activity specifically refers to:

Those professionals working in offices whose main task is to provide information to the public, public relations, reception of complaints, consultancy, client guidance or compilation of suggestions.

Such offices are frequently to be found in public administrations with the task of informing the public of the services rendered, institutions such as NGOs delivering social services, large-scale service enterprises, institutions offering consultancy services to firms and individuals, tourist services, etc.

Public relations is an activity for which there is a growing demand and involves an increasingly high level of training. Dealing with the public demands very keen social skills, as well as knowledge of the specific area of activity. The demand for lesser-skilled telephonists or receptionists is in decline, with the trend towards more highly skilled professionals.

In the field of public relations, information technology also plays a crucial role, in both database computer applications, Internet, CD-ROMs, interactive technologies, videoconferencing, digital publications, etc. An increasing number of people shall come to appreciate the opportunity of obtaining personalised, rapid information which shall require not only public relations professionals, but also locations enabling the public at large to use IT to self-access information of interest.

a) **New competencies**

Vocational competencies

The basic competencies of this professional are as follows:

- Design of a direct information and public relations plan relating to a specific product or service.
- Access to and maintenance of sources of information and guidance of members of the public to enable them to organise personalised searches.

This type of knowledge is backed up by a solid multiskilled training and specific knowledge in the fields of: public relations, human relations, marketing and information technology, general computer applications, especially databases, graphs and self-editing, telematics services, multimedia handling, etc. A solid basic educational background is required, especially in terms of comprehension, oral and written expression and specific knowledge of the social sciences.

Social and personal competencies

The most useful are as follows:

- Excellent communication skills: the ability to listen, anticipate others' needs and reply in a precise and friendly manner.
- Adaptability and tolerance of different views.
- The ability to work in a group.
- Self-confidence.
- A sense of initiative in seeking requested information.
- The aptitude to find rapid solutions to the queries from the public.
- Consistency and patience in dealing with themes and clients.

b) **Access requirements**

The diversity of the specialised fields requiring public relations may require different levels of academic training, ranging from the certificate of compulsory education to a university degree.

In general it could be said that those who receive initial information queries and pass them on to specialists must be qualified to at least the equivalent of compulsory secondary education. Those attending to or providing consultancy on specialised subjects must have at least the upper secondary-school leaving-certificate or a university degree, depending on the subjects involved: legal, economic, labour-related, training, sanitary issues, etc. In some services dealing with international clients, languages are indispensable for access to this occupation.

Recommended certificates vary considerably according to the information area in question: tourism, business, social work, health, legal affairs, etc.

c) **Continuing training**

As already indicated, persons with lower qualifications, e.g. traditional receptionists or telephonists, generally have to upgrade their training to avoid the risk of losing their jobs. From this point of view, it is a priority group in terms of continuing training. The essential training areas are basic general knowledge, computer literacy (databases) and public relations. Continuing training is necessary for all professionals in this area in the following fields: handling IT, personal computing, access to telematic etc. networks, public relations, teamwork, documentation, archives, etc.

This training is generally delivered by the firms themselves, especially if the services in question are very much subject to competition.

IV. CONCLUSIONS

In brief summary, the common trends which have emerged in the three Member States in conjunction with changes in competencies in the telecommunications and administration/office sectors in which information technology (IT) exerts a strong influence are as follows:

1. The introduction of IT in the various functional areas of both sectors tends to make mechanical, lesser-skilled tasks superfluous. Moreover, serious insertion problems are emerging for certain groups, with the gradual exclusion from employment in these areas of those with a certification level below the upper secondary school leaving-certificate or middle-level vocational training.

2. In these sectors, employment is not shrinking in global terms, but expanding in the long term, while skilling requirements are rising and multiskilling is increasingly in demand.

3. The new competencies required in the wake of the introduction of IT are fundamentally related to the ability to obtain, select, process and disseminate information. New methodological competencies related to knowledge of the organisation in question and how to move within that organisation are also necessary. In other words, in sectors in which information technology exerts a strong influence, social and organisational competencies are priorities.

4. The integral development of the human personality, the fundamental objective of all education and training, is therefore the very basis of the new competencies. This means that abilities such as self-esteem, creativity, adaptability, responsibility, self-control or the ability to work in a team or communicate with others are becoming the essential personality attributes of the competent professional.

5. The introduction of IT in firms and organisations tends to run parallel with organisational changes fundamentally involving the transition from highly hierarchized structures to project groups.

6. In a technological environment characterised by constant innovation such as the sectors under review, permanent ability to learn has become a fundamental competence for the majority of professionals.

7. Knowledge and information, the essential raw materials for production in the information society, are to be found within the context of the overall organisation, rather than at the level of individual professionals. This increases the responsibility of the firms as learning organisations.

8. The study also analysed initial and continuing training provision in the three Member States for the two sectors examined: telecommunications and administration/offices. This analysis must be completed to gain precise indications on each functional activity.

However, and although for reasons of space the observations for each country have not been included in this report, a number of observations were made for all three Member States:

- Initial training provision for the two sectors, both at university and vocational training level, is going through a significant period of renewal in terms of technological content. In the case of universities, short-cycle diplomas with a very distinct vocational leaning are gaining in importance.
- There has been a significant increase in the number of initial certificates and training places over the last decade, including a surplus of certificate-holders in some areas.
- The problem still remains the development of organisational and social competencies, to which syllabuses attach very little importance.
- In general terms, continuing training provision is not adequately planned by the firms in accordance with the new requirements in occupational areas in which IT exerts a strong influence; in the majority of cases continuing training is left to the initiative of the employee in the form of self-directed learning.

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2. FIRMS AND AGENCIES REPRESENTED BY THE INTERVIEWED EXPERTS AND PERSONS WHO HAVE CONTRIBUTED INFORMATION FOR THE PURPOSES OF THIS STUDY

SPAIN

- AGENCIA ESTATAL TRIBUTARIA
- ATT
- DGTEL
- FYCSA
- IMAF (Instituto Madrileño para la Formación)
- INEM (Instituto Nacional de Empleo)
- PLACEMENT CENTER
- TELEFONICA
- UNISYS

FRANCE

- CEREQ
- COMISSION PROFESSIONNELLE CONSULTATIVE 12 ème
- COMISSION PROFESSIONNELLE CONSULTATIVE 16 ème
- IDATE
- MINISTERE DE L'EDUCATION NATIONALE

ITALY

- ALCATEL
- ERICSON
- FINSIEL
- SEVA
- TELECOM
- TELESOFT

CEDEFOP – European Centre for the Development of Vocational Training

Competencies in two sectors in which information technology (IT) exerts a strong influence: Telecommunications and Administration/offices
Case studies in Italy, France and Spain
Lázaro González, Mario Gatti, Claudio Tagliaferro

CEDEFOP panorama

CEDEFOP – European Centre for the Development
of Vocational Training, Thessaloniki 1997

1997 – 60 pp. – 21.0 x 29.7 cm

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This study is part of the CEDEFOP work programme which envisages formulation of a reference framework which the European Commission could use as one component of a periodic report on the development of vocational training in the Member States.

The study, which was conducted in three countries (Spain, France and Italy), aims to identify new professional competencies in which information technologies have a particularly strong impact: telecommunications, a sector which plays a vital role in the evolution of IT and administration and office work which make general use of IT and which, while not a productive sector, is a transversal and intersectoral area processing data and information.

The study envisages the description of certain functional activities and definition of the required competencies in order to provide a reference framework for training curricula.

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Final report